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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,768	12/04/2003	Daniel R. Marshall	200309722-1	7584

22879 7590 10/29/2004

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EXAMINER

SONG, HOON K

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 10/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/727,768		MARSHALL, DANIEL R.	
	Examiner		Art Unit	
	Hoon Song		2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 19-25, 29 and 32 is/are rejected.
- 7) ☒ Claim(s) 10-18, 26-28, 30 and 31 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/4/03</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9, 19-25, 29 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Whitlock et al. (US 633968B1).

Regarding claim 1, Whitlock teaches an X-ray generating apparatus, comprising:

a semiconductor structure (72);

an emitter (66) formed on the semiconductor structure (72), the emitter to emit electrons; and

an element (62) to generate X-rays in response to impact by the electrons (56) on the element.

Regarding claim 2, Whitlock teaches a deflecting mechanism (174) to deflect a path of the electrons.

Regarding claim 3, Whitlock teaches the deflecting mechanism is adapted to deflect the electrons from a first path to a second path, the first path being at a non-zero angle with respect to the second path (figure 6b).

Regarding claim 4, Whitlock teaches the deflecting mechanism is adapted to generate an electric (182) field to deflect the electrons (figure 6b).

Regarding claim 5, Whitlock teaches the deflecting mechanism is adapted to generate a magnetic field to deflect the electrons (column 13 line 20-45).

Regarding claim 6, Whitlock teaches the emitter comprises a field emitter (figure 2b).

Regarding claim 7, Whitlock teaches the emitter comprises a pointed tip and elements to apply an electric field to cause emission of electrons from the pointed tip (figure 2b).

Regarding claim 8, Whitlock teaches the emitter further comprises a lens (804) element to focus the electrons emitted from the pointed tip.

Regarding claim 9, Whitlock teaches the emitter further comprises a lens element to collimate (804) the electrons emitted from the pointed tip.

Regarding claim 19, Whitlock teaches the element is formed of a material containing tungsten (column 10 line 25).

Regarding claim 20, Whitlock teaches the element is formed of a material containing molybdenum (column 10 line 25).

Regarding claim 21, Whitlock teaches a method of generating X-rays, comprising:

- activating an emitter on a semiconductor structure (72) to emit electrons; and
- directing the electrons onto a target (62) to cause the target to generate X-rays.

Regarding claim 22, Whitlock teaches activating the emitter comprises generating an electric field to cause emission of electrons from a pointed tip in the emitter (figure 2b).

Regarding claim 23, Whitlock teaches collimating the emitted electrons using a lens element (804).

Regarding claim 24, Whitlock teaches deflecting the emitted electrons from a first path to a second path (figure 6b).

Regarding claim 25, Whitlock teaches accelerating the electrons traveling in the second path to increase an energy of the electrons prior to impact of the electrons onto the target.

Regarding claim 29, Whitlock teaches an X-ray source device, comprising:
a housing (52) defining a chamber;
a semiconductor structure (72, 68) disposed in the chamber, the chamber containing a vacuum;
a field emitter (74) formed on the semiconductor structure to emit electrons; and
a target (56) in the chamber to generate X-rays in response to impact by the electrons.

Regarding claim 32, Whitlock teaches an X-ray source device, comprising:
a housing (52) defining a chamber;
at least two semiconductor structures (72, 68) disposed in the chamber, the chamber containing a vacuum, the at least two semiconductor structures being generally parallel to each other (figure 2b);
a field emitter (74) formed on one of the at least two semiconductor structures to emit electrons;

a deflecting mechanism (174) in the chamber to deflect the electrons from a first path to a second path; and

a target (62) in the chamber to generate X-rays in response to impact by the electrons.

Allowable Subject Matter

Claims 10-18, 26-28 and 30-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to teach an accelerator having electrodes formed on the semiconductor structure, the accelerator to accelerate the electrons as claimed in dependent claims 10 and 30.

The prior art fails to teach a method of accelerating the electrons comprises accelerating the electrons with an accelerator having electrodes formed on the semiconductor structure as claimed in dependent claim 25.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HKS

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HKS


DAVID V. BRUCE
PRIMARY EXAMINER